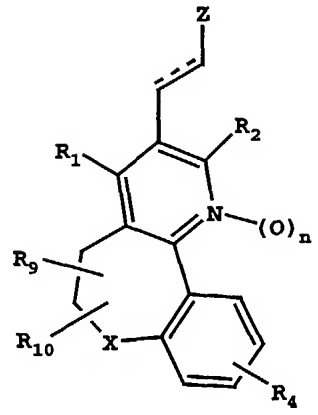
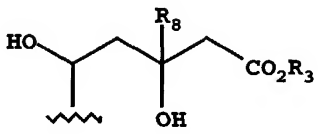
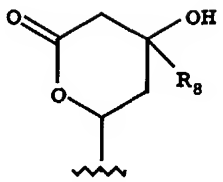
What is claimed is:

1. A compound having the structure



wherein X is O, S, SO, SO_2 or NR_7;

Z is  or  ;

n is 0 or 1;

R_1 and R_2 are the same or different and are independently selected from alkyl, arylalkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, heteroaryl or cycloheteroalkyl;

R_3 is H or lower alkyl or a metal ion;

R_4 is H, halogen, CF_3, hydroxy, alkyl, alkoxy, carboxyl, carboxyalkyl-, aminoalkyl, amino, alkanoylamino, aroylamino, cyano, alkoxyCON(R_{7d})-, $R_{7f}R_{7g}NCO_2$-, $R_{7f}R_{7g}NCO$-, $R_{7e}SO_2N(R_{7d})$-, $R_{7f}R_{7g}NSO_2N(R_{7d})$-, $R_{7e}OCO_2$- or $R_{7e}OCO$;

R_7 is H, alkyl, aryl, alkanoyl, aroyl or alkoxycarbonyl, $R_{7a}SO_2$-, $R_{7b}R_{7c}NSO_2$- or $R_{7b}R_{7c}NCO$-;

R_{7a} and R_{7e} are the same or different and are independently selected from alkyl, arylalkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, heteroaryl or cycloheteroaryl;

R_{7b} and R_{7c}, and R_{7f} and R_{7g}, and R_{7d} are the same or different and are independently selected from H, alkyl,

arylalkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, heteroaryl or cycloheteroalkyl;

or R_{7b} and R_{7c} may be taken together with the nitrogen to which they are attached to form a stable 3 to 8 membered heterocyclic ring, which, where applicable, includes 1 to 3 heteroatoms in the ring; or R_{7f} and R_{7g} may be taken together with the nitrogen to which they are attached to form a stable 3 to 8 membered ring, which, where appicable, includes 1 to 3 heteroatoms in the ring.

R_8 is H or lower alkyl;

R_9 and R_{10} are the same or different and are independently selected from H or alkyl; or where at least one of R_9 and R_{10} is alkyl, R_9 and R_{10} may be taken together with the carbon or carbons to which they are attached to form a 3 to 7 membered carbocyclic ring, which may include a spirocyclic ring;

and represents a single bond or a double bond (which may be cis or trans);

or a pharmaceutically acceptable salt thereof (where R_3 is H), or ester thereof, a prodrug ester thereof, and all stereoisomers thereof.

2. The compound as defined in Claim 1 wherein  is a double bond which is trans.

3. The compound as defined in Claim 1 wherein Z is in the form of a pharmaceutically acceptable basic salt.

4. The compound as defined in Claim 1 in the form of a pharmaceutically acceptable acid addition salt.

5. The compound as defined in Claim 1 in the form of the δ-lactone thereof.

6. The compound as defined in Claim 1 wherein X is O, SO_2 or NR_7 where R_7 is $R_{7a}SO_2$-.

7. The compound as defined in Claim 1 wherein R_1 and R_2 are independently selected from alkyl, cycloalkyl and aryl;

R_4 is H or halogen;

n is o;

and X is O.

8. The compound as defined in Claim 1 wherein R_1 is aryl,

R_2 is alkyl or cycloalkyl;

R_4 is H;

n is o;

X is O; and

 is a trans double bond, in the form of a free acid or an alkali or alkaline earth metal salt or an amino acid salt.

9. The compound as defined in Claim 8 wherein R_1 is phenyl which contains 1 or 2 substituents,

R_2 is alkyl or cycloalkyl;

R_4 is H;

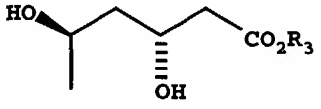
X is O; and

 is a trans double bond, in the form of a free acid or an alkali or alkaline earth metal salt or an amino acid salt.

10. The compound as defined in Claim 9 wherein R_1 is 4-fluorophenyl, 4-fluoro-3-methylphenyl, or 3,5-dimethylphenyl; and

R_2 is isopropyl, t-butyl or cyclopropyl.

11. The compound as defined in Claim 1 wherein Z has the structure



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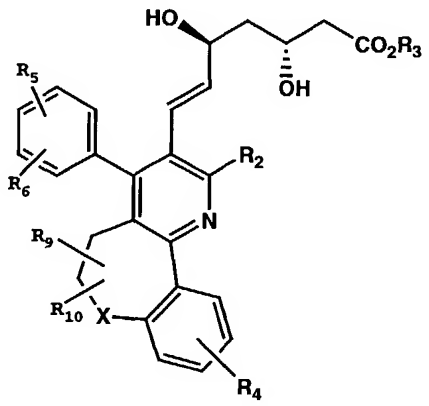
12. The compound as defined in Claim 1 wherein X is SO, SO_2 or NR_7.

13. The compound as defined in Claim 12 wherein R_7 is $R_{7a}SO_2$-, $R_{7b}R_{7c}NSO_2$-, or $R_{7b}R_{7c}NCO$-.

14. The compound as defined in Claim 12 wherein R_4 is alkoxycarbonylamino-, $R_{7f}R_{7g}NCO_2$-, $R_{7e}SO_2N(R_{7d})$- or $R_{7f}R_{7g}NSO_2N(R_{7d})$-.

15. A compound having the structure



or an alkali or alkaline earth metal salt thereof or an amino acid salt or an acid addition salt via the pyridine of the corresponding δ lactone,

wherein R_5 and R_6 are the same or different and are independently selected from H, halogen or alkyl and

R_2 is alkyl or cycloalkyl;

R_4 is H;

R_9 and R_{10} are each H;

X is O;

and R_3 is H or an alkali or alkaline earth metal or an amino acid salt or other pharmaceutically acceptable salt or the internal lactone thereof.

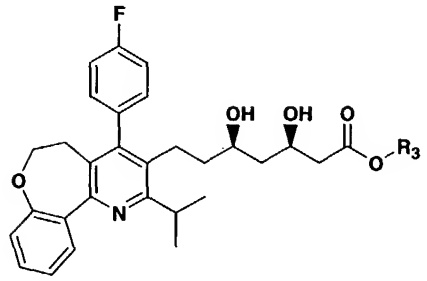
16. The compound as defined in Claim 15 wherein R_5 and R_6 are H and 4-fluoro;

H and 4-fluoro-3-methyl or

3,5-dimethyl; and

R_2 is isopropyl, t-butyl or cyclopropyl.

17. The compound as defined in Claim 15 having the structure



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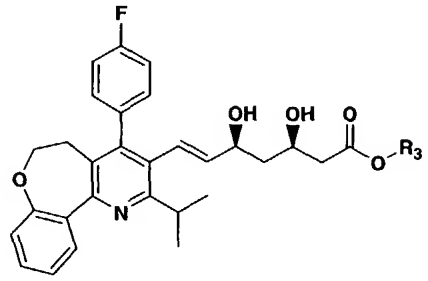
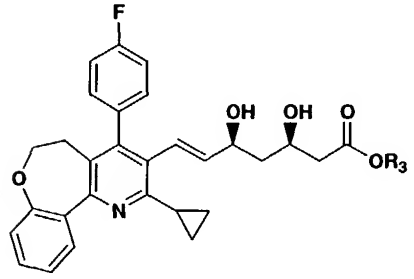
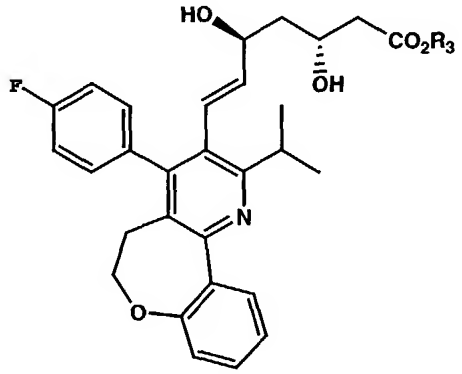


or



wherein R_3 is H or an alkali or alkaline earth metal or an amino acid salt or other pharmaceutically acceptable salt, or the internal lactone thereof.

18. A compound of the structure



wherein R_3 is H or an alkali or alkaline earth metal ion or an amino acid, or the internal lactone thereof.

19. The compound as defined in Claim 18 in the form of the sodium salt.

20. A pharmaceutical composition comprising a compound as defined in Claim 1 and a pharmaceutically acceptable carrier therefor.

21. A pharmaceutical combination comprising the HMG CoA reductase inhibitor compound as defined in Claim 1 and one or more hypolipidemic agents or lipid-lowering agents, or lipid agents, or lipid modulating agents, and/or one or more other types of therapeutic agents including antidiabetic agents, anti-obesity agents, antihypertensive agents, platelet aggregation inhibitors, anti-dementia agents, anti-Alzheimer's agents, anti-osteoporosis agents, and/or hormone replacement therapeutic agents, and/or other cardiovascular agents (including anti-anginal agents, anti-arrhythmic agents, anti-atherosclerosis agents, anti-inflammatory agents, anti-arthritis agents, anti-platelet agents, anti-heart failure agents), anti-cancer agents, anti-infective agents, hormone replacement agents, growth hormone secretagogues, selective androgen receptor modulators, and/or immunomodulatory agents.

22. The combination as defined in Claim 21 wherein the hypolipidemic agent or lipid-lowering agent or other lipid agent or lipid modulating agent or anti-atherosclerotic agent, which is employed comprises 1,2,3 or more MTP inhibitors, HMG CoA reductase inhibitors, squalene synthetase inhibitors, fibric acid derivatives, PPAR α agonists, PPAR dual α/γ agonists, PPAR δ agonists, ACAT inhibitors, lipoxygenase inhibitors, cholesterol absorption inhibitors, ileal Na^+/bile acid cotransporter inhibitors, upregulators of LDL receptor activity, cholesteryl ester transfer protein inhibitors, bile acid sequestrants, or nicotinic acid and derivatives thereof, ATP citrate lyase inhibitors, phytoestrogen compounds, an HDL upregulators, LDL catabolism promoters, antioxidants, PLA-2 inhibitors, antihomocysteine agents, HMG-CoA

synthase inhibitors, lanosterol demethylase inhibitors, or sterol regulating element binding protein-I agents.

23. The pharmaceutical combination as defined in Claim 21 comprising said HMG CoA reductase inhibiting compound and an antidiabetic agent.

24. The combination as defined in Claim 23 wherein the antidiabetic agent which may be optionally employed is 1,2,3 or more antidiabetic agents or antihyperglycemic agents including insulin secretagogues or insulin sensitizers, which may include biguanides, sulfonyl ureas, PTP-1B inhibitors, aldose reductase inhibitors, glucosidase inhibitors, PPAR γ agonists, PPAR α agonists, PPAR δ antagonists or agonists, aP2 inhibitors, PPAR α/γ dual agonists, dipeptidyl peptidase IV (DP4) inhibitors, SGLT2 inhibitors, glycogen phosphorylase inhibitors, and/or meglitinides, insulin, and/or glucagon-like peptide-1 (GLP-1) or a mimetics thereof.

25. The combination as defined in Claim 24 wherein the antidiabetic agent is 1, 2, 3 or more of metformin, glyburide, glimepiride, glipyride, glipizide, chlorpropamide, gliclazide, acarbose, miglitol, pioglitazone, troglitazone, rosiglitazone, insulin, Gl-262570, isaglitazone, JTT-501, NN-2344, L895645, YM-440, R-119702, AJ9677, repaglinide, nateglinide, KAD1129, AR-HO39242, GW-409544, KRP297, AC2993, LY315902, P32/98 and/or NVP-DPP-728A.

26. The combination as defined in Claim 21 wherein the HMG CoA reductase inhibiting compound is present in a weight ratio to the lipid-lowering agent or antidiabetic agent within the range from about 0.001:1 to about 100:1.

27. The combination as defined in Claim 21 wherein the other type of therapeutic agent which may be optionally employed is 1, 2, 3 or more of an anti-obesity

agent which is a beta 3 adrenergic agonist, a lipase inhibitor, a serotonin (and dopamine) reuptake inhibitor, an aP2 inhibitor, a thyroid receptor beta drug, an anorectic agent, a PTP-1B inhibitor, a CCKA agonist, a neuropeptide Y antagonist, a melanocortin-4-receptor agonist, a PPAR modulator which is a PPAR γ antagonist, PPAR α agonist, and/or PPAR δ antagonist, a leptin inhibitor such as a leptin receptor activator, a fatty acid oxidation upregulator or inducer.

28. The combination as defined in Claim 27 wherein the anti-obesity agent is orlistat, ATL-962, AJ9677, L750355, CP331648, sibutramine, topiramate, axokine, dexamphetamine, phentermine, phenylpropanolamine, and/or mazindol, P57 or CP-644673 (Pfizer).

29. The combination as defined in Claim 21 wherein the lipid modulating agent is an MTP inhibitor, an HMG CoA reductase inhibitor, a squalene synthetase inhibitor, a fibric acid derivative, an upregulator of LDL receptor activity, a lipoxygenase inhibitor, or an ACAT inhibitor and the other lipid agent is a cholesteryl ester transfer protein inhibitor.

30. The combination as defined in Claim 29 wherein the lipid modulating agent is pravastatin, lovastatin, simvastatin, atorvastatin, cerivastatin, fluvastatin, pitavastatin, rosuvastatin, fenofibrate, gemfibrozil, clofibrate, avasimibe, TS-962, MD-700, cholestagel, niacin, and/or LY295427.

31. The combination as defined in Claim 21 wherein the antihypertensive agent employed is an ACE inhibitor, angiotensin II receptor antagonist, NEP inhibitor, a NEP/ACE inhibitor, a calcium channel blocker, a T-channel calcium antagonist, a β-adrenergic blocker, a diuretic, a

α-adrenergic blocker, a dual action receptor antagonist (DARA), or a heart failure drug.

32. The combination as defined in Claim 31 wherein the antihypertensive agent is an ACE inhibitor which is captopril, fosinopril, enalapril, lisinopril, quinapril, benazepril, fentiapril, ramipril or moexipril;

an NEP/ACE inhibitor which is omapatrilat, gemopatrilat, or CGS 30440;

an angiotensin II receptor antagonist which is irbesartan, losartan or valsartan;

amlodipine besylate, prazosin HCl, verapamil, nifedipine, nadolol, propranolol, or clonidine HCl, carvediol, atenolol, hydrochlorothiazide, torasemide, furosemide, spironolactone or indapamide.

33. The combination as defined in Claim 21 wherein the HMG CoA reductase inhibitor is in combination with an ACE inhibitor or a NEP/ACE inhibitor.

34. The combination as defined in Claim 21 wherein the HMG CoA reductase inhibitor is in combination with an ACE inhibitor which is rampipril.

35. The combination as defined in Claim 21 wherein the HMG CoA reductase inhibitor is in combination with a NEP/ACE inhibitor which is omapatrilat or gemopatrilat.

36. The combination as defined in Claim 21 wherein the HMG CoA reductase inhibitor is in combination with a platelet aggregation inhibitor.

37. The combination as defined in Claim 36 wherein the platelet inhibitor is clopidogrel.

38. The combination as defined in Claim 36 wherein the platelet inhibitor is clopidogrel, aspirin or a combination of clopidogrel and aspirin.

39. The combination as defined in Claim 21 wherein the platelet aggregation inhibitor is aspirin, clopidogrel, ticlopidine, dipyridamole, ifetroban, abciximab, tirofiban, eptifibatide, or anagrelide.

40. The combination as defined in Claim 21 wherein the other therapeutic agent is an anti-Alzheimer's agent or anti-dementia agent, which is tacrine HCl (Cognex®), donepezil (Aricept®), a Υ-secretase inhibtor, a β-secretase inhibitor and/or antihypertensive agent;

an antiosteoporosis agent, which is parathyroid hormone, a bisphosphonate, alendronate, a Ca receptor agonist or a progestin receptor agonist;

a hormone replacement therapeutic agent, which is a selective estrogen receptor modulator (SERM);

a tyrosine kinase inhibitor;

a selective androgen receptor modulator;

an antiarrhythmic agent, which is a β-blocker, or a calcium channel blocker, or an α-adrenergic blocker;

coenzyme Q sub. 10;

an agent that upregulates type III endothelial cell nitric acid syntase;

a chondroprotective compound which is polysulfated glycosaminoglycan (PSGAG), glucosamine, chondroitin sulfate (CS), hyaluronic acid (HA), pentosan polysulfate (PPS), doxycycline or minocycline;

a cyclooxygenase (COX)-2 inhibitor, which is Celebrex® (Searle) or Vioxx® (Merck) or a glycoprotein IIa/IIIb receptor antagonist;

a 5-HT reuptake inhibitor;

a growth hormone secretagogue;

an anti-atherosclerosis agent;

an anti-infective agent, or an immunosuppressant for use in transplantation, or an antineoplastic agent.

41. A method for treating hypercholesterolemia, dyslipidemia, hyperlipidemia, hyperlipoproteinemia, LDL Pattern B, LDL Pattern A, hypertriglyceridemia or atherosclerosis, or Alzheimer's disease or osteoporosis, which comprises administering to a mammalian species in need of treatment a therapeutically effective amount of a compound as defined in Claim 1.

42. A method of inhibiting cholesterol biosynthesis or lowering blood serum cholesterol levels and/or modulating blood serum cholesterol levels, lowering LDL cholesterol and/or increasing HDL cholesterol, or treating dyslipidemia, mixed dyslipidemia, LDL Pattern B, LDL Pattern A, hyperlipidemia, hypercholesterolemia, hypo α-lipoproteinemia, hyperlipoproteinemia or hypertriglyceridemia, and other aberrations of apolipoprotein B metabolism, or reducing levels of Lp(a), or treating or preventing other cholesterol-related diseases, or treating or preventing or reversing progression of atherosclerosis, or preventing or treating Alzheimer's disease, or preventing or treating osteoporosis and/or osteopenia, or reducing inflammatory markers, reducing C-reactive protein, or preventing or treating low grade vascular inflammation, or preventing or treating stroke, or preventing or treating dementia, or preventing and treating coronary heart disease, and primary and secondary prevention of myocardial infarction, or preventing or treating stable and unstable angina, or primary prevention of coronary events, or secondary prevention of cardiovascular events, or preventing or treating peripheral vascular disease, preventing or treating peripheral arterial disease, or preventing or treating acute vascular syndromes, or preventing or reducing the risk of undergoing myocardial

revascularization procedures, or preventing or treating microvascular diseases such as nephropathy, neuropathy, retinopathy and nephrotic syndrome, or preventing or treating hypertension in a patient in need of such treatment, which comprises administering to a mammalian species in need of treatment a therapeutically effective amount of a compound in accordance with Claim 1.

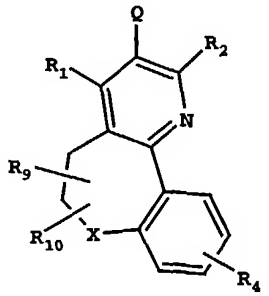
43. A method for preventing or treating diabetes, especially Type 2 diabetes, and related diseases, insulin resistance, hyperglycemia, hyperinsulinemia, elevated blood levels of fatty acids or glycerol, obesity, LDL Pattern B, LDL Pattern A, Syndrome X, diabetic complications, dysmetabolic syndrome, and related diseases, and sexual dysfunction, which comprises administering to a mammalian species in need of treatment a therapeutically effective amount of a compound as defined in Claim 1.

44. A method for preventing and treating malignant lesions, premalignant lesions, gastrointestinal malignancies, liposarcomas and epithelial tumors, cancer-induced asthenia (fatigue), irritable bowel syndrome, Crohn's disease, gastric ulceritis, and gallstones, and HIV infection, drug-induced lipodystrophy, and proliferative diseases, which comprises administering to a mammalian species in need of treatment a therapeutically effective amount of a compound as defined in Claim 1.

45. A method for improving coagulation homeostasis, reducing PAI-1 activity, reducing fibrinogen, and/or reducing platelet aggregation, and/or improving endothelial function, which comprises administering to a mammalian species in need of treatment a therapeutically effective amount of a compound as defined in Claim 1.

46. A method for treating cholesterol related diseases, diabetes and related diseases, cardiovascular diseases, cerebrovascular diseases, which comprises administering to a mammalian species in need of treatment a therapeutically effective amount of a combination of a compound as defined in Claim 1 and a hypolipidemic agent, and/or lipid modulating agent and/or antidiabetic agent and/or cardiovascular agent, cerebrovascular agent, and/or other type of therapeutic agent, which comprises administering to a mammalian species in need of treatment a therapeutically efective amount of such combinations.

47. A compound having the structure



wherein X is O, S, SO, SO_2 or NR_7 where R_7 is H, alkyl, aryl, alkanoyl, aroyl, alkoxycarbonyl, $R_{7a}SO_2$-, $R_{7b}R_{7c}NSO_2$- or $R_{7b}R_{7c}NCO$;

R_1 and R_2 are the same or different and are independently selected from alkyl, arylalkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, heteroaryl or cycloheteroalkyl;

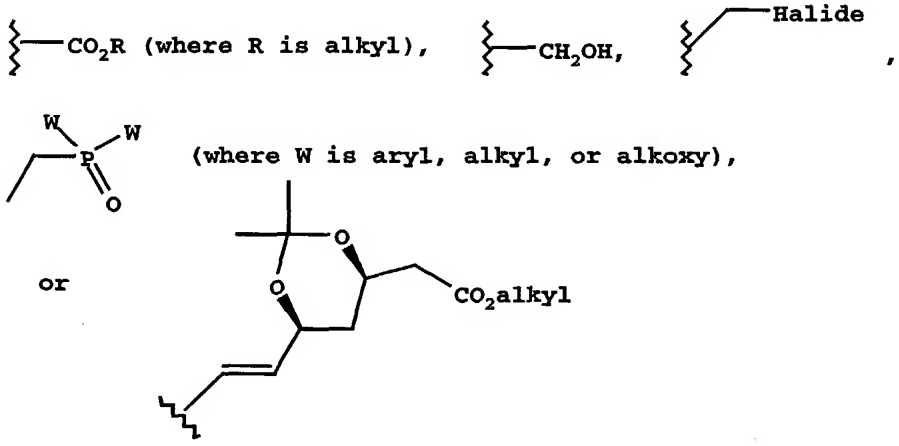
R_4 is H, halogen, CF_3, hydroxy, alkyl, alkoxy, alkanoylamino, aroylamino, cyano, alkoxyCON(R_{7d})-, $R_{7f}R_{7g}$NCOalkoxy-, $R_{7e}SO_2N(R_{7d})$- or $R_{7f}R_{7g}NSO_2N(R_{7d})$-;

R_{7a} and R_{7e} are the same or different and are independently selected from alkyl, arylalkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, heteroaryl or cycloheteroalkyl;

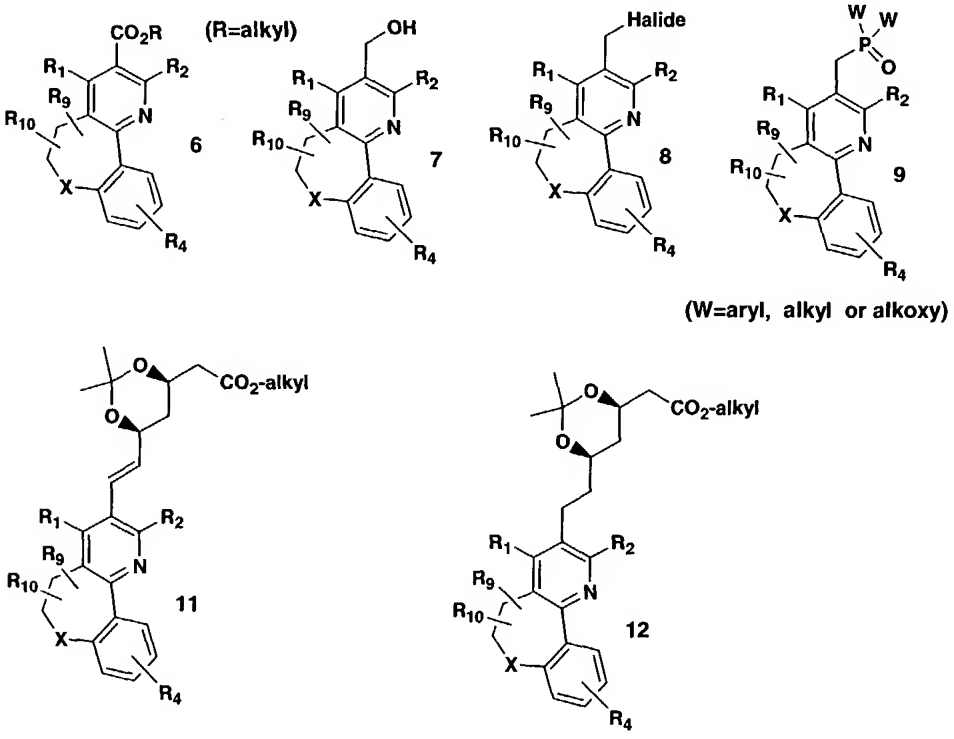
R_{7b} and R_{7c}, and R_{7f} and R_{7g}, and R_{7d} are the same or different and are independently selected from H, alkyl,

arylalkyl, cycloalkyl, alkenyl, aryl, heteroaryl or cycloheteroalkyl;

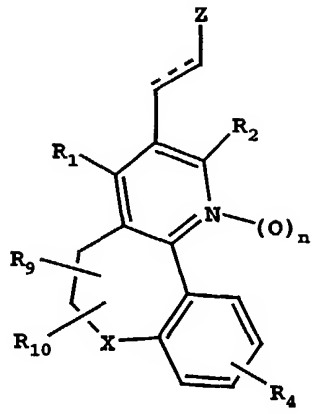
R_9 and R_{10} are the same or different and are independently selected from H or alkyl, or R_9 and R_{10} may be taken together with the carbon or carbons to which they are attached to form a 3 to 7 membered carbocyclic ring;

Q is 

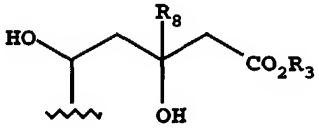
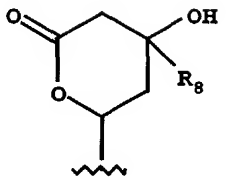
48. The compound as defined in Claim 47 having the following structures:



49. A compound having the structure



wherein X is O, S or NR_7;

Z is  or  ;

n is 0 or 1;

R_1 and R_2 are the same or different and are independently selected from alkyl, arylalkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, heteroaryl or cycloheteroalkyl;

R_3 is H or lower alkyl;

R_4 is H, halogen, CF_3, hydroxy, alkyl, alkoxy, alkanoylamino, aroylamino, or cyano;

R_7 is H, alkyl, aryl, alkanoyl, aroyl or alkoxycarbonyl;

R_8 is H or lower alkyl;

R_9 and R_{10} are the same or different and are independently selected from H or alkyl, or R_9 and R_{10} may be taken together with the carbon or carbons to which they are attached to form a 3 to 7 membered carbocyclic ring;

and  represents a single bond or a double bond (which may be cis or trans);

and including pharmaceutically acceptable salts thereof (where R_3 is H), esters thereof, prodrug esters thereof, and all stereoisomers thereof.